

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-31 remain pending, claims 1, 18, and 31 being independent.

Prior Art Rejections

1. **Shelly - Gallios**

Claims 1, 7-12, 18-22, and 24-31 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Shelly (U.S. Patent 4,251,857) in view of Gallios et al. (U.S. Patent 4,893,227). This rejection is respectfully traversed.

Independent claim 1 is directed to a high-voltage power supply. The high-voltage power supply of claim 1 comprises: a power scaling section receiving an input voltage signal and converting the input voltage signal to a controllable DC voltage; a push-pull converter for converting the controllable DC voltage to a high-frequency wave; and a voltage multiplier receiving the high-frequency wave generated by the push-pull converter and performing successive voltage doubling operations to generate a high-voltage DC output, the generated high-voltage DC output being varied as the controllable DC voltage varies. Therefore, the high-voltage power supply of claim 1 generates a variable high-voltage output, based on the controllable DC voltage generated by the power scaling section, by using a push-pull converter to convert a controllable DC voltage to a high-frequency wave and a voltage multiplier to perform successive voltage doubling operations on the high-frequency wave output by the push-pull converter.

Independent claim 31 is also directed to a high-voltage power supply. The high-voltage power supply of claim 31 comprises: a power scaling section receiving an input voltage signal and converting the input voltage signal to a controllable DC voltage; a push-pull converter for converting the controllable DC voltage to a high-frequency wave, the high-frequency wave having a frequency greater than approximately 20 kHz; and a voltage multiplier receiving the high-frequency wave generated by the push-pull converter and performing successive voltage doubling operations to generate a high-voltage DC output, the generated high-voltage DC output

being varied as the controllable DC voltage varies so as to output various desired output voltage levels in a range that includes voltages up to approximately 30kV.

As discussed in the Reply dated July 28, 2005, the primary reference, Shelly, discloses a power supply having: a DC-DC chopper-converter unit 10, which converts an input voltage VIN to a lower voltage; and a DC-DC inverter-converter 12, which converts the voltage output by the DC-DC chopper-converter 10 to an output voltage VOUT. The power supply of Shelly compensates for variations in the power supply's output voltage due to variations in output loading. More specifically, the power supply of Shelly illustrated in Fig. 1 includes a sensing network 14, which outputs a current signal i1 that varies in proportion to output voltage variations, thereby causing the output voltage of the DC-DC chopper-converter 10 to compensate for such output voltage variations. See e.g., Fig. 1; col. 3, lines 16-36.

Page 4 of the Office Action acknowledges that the power supply of Shelly lacks a voltage multiplier for performing successive voltage doubling operations to generate a high-voltage DC output as recited in claims 1 and 31, but relies on the secondary teachings of Gallios as allegedly making up for this deficiency of Shelly. More specifically, pages 4-5 of the Office Action state that:

...it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shelly to include a voltage multiplier for receiving high frequency wave generated by a push pull converter for performing successive voltage doubling operations to generate a high voltage dc output in order to provide high output voltage to a load requiring very high output voltage as taught by Gallios et al and to produce the high frequency wave at approximately 100kHz in order to afford high power density by the high switching frequency used, enabling the use of much smaller, lighter, and lower cost magnetics and capacitors.

Applicants respectfully submit that this reasoning fails to establish prima facie obviousness of claim 1 or claim 31.

To establish prima facie obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of prior art must be supported by some teaching, suggestion, or motivation in the applied reference or in knowledge generally available

to one skilled in the art. In re Fine, 837, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a prima facie case of obviousness. In re Brouwer, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. In re Hedges, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); In re Ehrreich, 590 F.2d 902, 908-09, 200 USPQ 504, 510 (CCPA 1979).

The asserted rejection of claim 1 is based on the assertion that the power supply of Shelly includes a push-pull converter as claimed, which converts a controllable DC voltage output by a power scaling section to a high-frequency wave. Applicants note, however, that there is no teaching in Shelly that the DC-DC inverter-converter 12 outputs a high-frequency wave. Although the Examiner cites the Abstract of Shelly, there is no mention in the Abstract (or the remainder of Shelly) that the DC-DC inverter-converter 12 outputs a high-frequency wave as claimed. Page 2 of the Office Action asserts that:

[A]pplicant has not claimed what the applicant believes to be high frequency; the examiner contends that the frequency at which the inverter of Shelly operates at is considered "high"; therefore, Shelly does disclose outputting a high frequency wave.

The proper interpretation of the term "high frequency" must be consistent with the interpretation that those skilled in the art would reach and should be consistent with the specification. See e.g., MPEP § 2111.01. Applicants submit that one of ordinary skill in the art would not interpret the term "high frequency" as meaning any frequency, particularly in the context of the claimed power supply. Thus, the Examiner's rejection of claim 1 is based on an overly-broad claim interpretation.

Furthermore, with reference to the Examiner's reliance on column 5, line 31 of Gallios as allegedly disclosing the specific high-frequency wave output from the push-pull converter to the voltage multiplier of claim 31, Applicants note that this cited portion of Gallios refers to switching frequency of transistors in a power stage 20 that includes a transformer T10, not the

frequency of a wave output to a voltage multiplier stage that performs successive voltage doubling operations as claimed.

Furthermore, the Examiner has failed to establish that one of ordinary skill in the art would have been motivated to incorporate a voltage multiplier as allegedly taught by Gallios in the power supply of Shelly. Applicants again note that the DC-DC inverter-converter 12 and DC-DC chopper-inverter 10 combination of Shelly is specifically designed to regulate voltage appearing at the loads being supplied therein. Modifying Shelly to incorporate a voltage multiplier with successive voltage operations would appear to require a significant redesign of the power conversion elements specifically disclosed therein. Still further, the power supply of Shelly compensates for load-induced output voltage fluctuations with a current sensing circuit arrangement 14 that generates a current that varies in proportion to such voltage fluctuations in the particular power supply arrangement disclosed therein. Modifying the power supply of Shelly as proposed by the Examiner would appear to render the particular disclosed current sensing arrangement 14 unsuitable for this purpose. See e.g., MPEP § 2143.02 (specifying that a proposed modification or combination relied on to assert obviousness cannot change the principle operation of the prior art being modified).

At least for the above reasons, Applicants respectfully submit that the asserted grounds of rejection fails to establish prima facie obviousness of claim 1 (or claims depending therefrom) or claim 31. Independent claim 18, and claims depending therefrom, define over the asserted combination based upon similar reasoning to that set forth above with regard to claim 1.

At least in view of the above, Applicants respectfully request that the prior art rejection based on the asserted combination of Shelly and Gallios be reconsidered and withdrawn.

2. Shelly - Gallios - Gak

Claims 2-6 and 23 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Shelly in view of Gallios and Gak. This rejection is respectfully traversed.

As set forth on pages 6-7 of the Office Action, the Examiner relies on Gak as allegedly teaching incremental features of dependent claims 2-6 and 23. The Examiner's reliance on Gak, however, fails to make up for the deficiencies of the Shelly-Gallios combination discussed above with respect to the independent claims. Accordingly, Applicants respectfully submit that the asserted combination of Shelly, Gallios, and Gak (assuming these references may be combined, which Applicants do not admit) fails to establish prima facie obviousness of any pending claim.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 103 based on the asserted combination of Shelly, Gallios, and Gak.

3. Shelly - Gallios - Adasko

Claims 13-17 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Shelly in view of Gallios, and further in view of Adasko et al. (U.S. Patent 5,414,224). This rejection is respectfully traversed.

As set forth on page 8 of the Office Action, the Examiner relies on additional secondary teachings of Adasko as allegedly disclosing incremental features of dependent claims 13-17. Initially, Applicants note that the Examiner's reliance on Adasko fails to make up for the deficiencies of the base Shelly-Gallios combination discussed above with respect to the independent claims. Furthermore, in response to the Examiner's apparent position that these claims relate to matters of routine skill in the art, Applicants respectfully submit that this reasoning fails to provide motivation for modifying Shelly in a manner that satisfies the features of these claims.

At least in view of the above, Applicants respectfully submit that the asserted combination of Shelly, Gallios, and Adasko (assuming these references may be combined, which Applicants do not admit) fails to establish prima facie obviousness of any pending claim.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 103 based on the asserted combination of Shelly, Gallios, and Adasko.

Application No. 10/630,684
Amendment dated December 6, 2005
After Final Office Action of September 6, 2005

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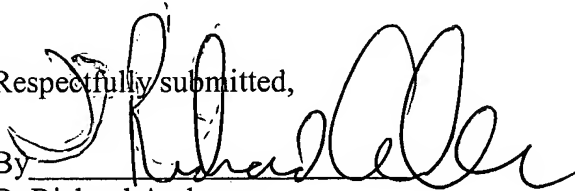
CONCLUSION

If the Examiner has any questions concerning this application, the Examiner is requested to contact the undersigned at the telephone number of (703) 205-8000. Facsimile communications may be sent to facsimile number (703) 205-8050.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

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Respectfully submitted,

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